

# Financial Distress Is Associated With Delay in Seeking Care for Hand Conditions

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## Abstract

**Background:** As medical costs continue to rise, financial distress due to these costs has led to poorer health outcomes and patient cost-coping behavior. Here, we test the null hypothesis that financial distress is not associated with delay of seeking care for hand conditions. **Methods:** Eighty-seven new patients presenting to the hand clinic for nontraumatic conditions completed our study. Patients completed validated instruments for measuring financial distress, pain catastrophizing, and pain. Questions regarding delay of care were included. The primary outcome was self-reported delay of the current hand clinic visit. **Results:** Patients who experience high financial distress differed significantly from those who experience low financial distress with respect to age, race, annual household income, and employment status. Those experiencing high financial distress were more likely to report having delayed their visit to the hand clinic (57% vs 30%), higher pain catastrophizing scores (17.7 vs 7.6), and higher average pain in the preceding week (4.5 vs 2.3). After adjusting for age, sex, and pain, high financial distress (adjusted odds ratio [OR] = 4.90) and pain catastrophizing score (adjusted OR = 0.96) were found to be independent predictors of delay. Financial distress was highly associated with annual household income in a multivariable linear regression model. **Conclusions:** Patients with nontraumatic hand conditions who experience higher financial distress are more likely to delay their visit to the hand clinic. Within health care systems, identification of patients with high financial distress and targeted interventions (eg, social or financial services) may help prevent unnecessary delays in care.

**Keywords:** psychosocial, research and health outcomes, financial distress, access, delay, socioeconomic determinant of health

## Introduction

Although passage of the Affordable Care Act resulted in significant gains in coverage and access to health care,<sup>1</sup> significant financial barriers to health care access remain in the United States.<sup>2</sup> In fact, a recent international study found that one-third of US adults reported encountering a cost-related barrier to care access within the past year, the highest of the 11 countries in the study.<sup>3</sup> Financial barriers to care are especially prevalent among low-income US adults, with 43% encountering such barriers within the past year and over a third waiting 6 or more days to obtain medical care. Barriers are also prevalent among the elderly despite Medicare coverage.<sup>3,4</sup> These cost-related barriers to health care access, comprising both objective financial burden and subjective financial distress due to medical costs, have received recent attention.<sup>5,6</sup>

Increased financial distress has been associated with disability in orthopaedic patients and the use of cost-coping

mechanisms such as delaying treatment or skipping clinic visits in cancer patients.<sup>7,8</sup> Lack of health insurance, underinsurance, financial concerns about care access among insured populations, and low income have each been linked to delays in seeking care and/or forgoing care altogether.<sup>9,10</sup> Notably, a recent study showed that increased financial distress was associated with delaying or forgoing general medical care due to cost, with a particularly striking result that 41% of the insured population also reported delaying or forgoing care due to cost.<sup>11</sup> Despite these data revealing the

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effects of financial distress on patient decision-making in general medical care, it is unclear whether these results are applicable to hand surgery, as hand conditions tend to carry a large functional and economic burden with short-term work and/or life consequences if care is delayed.<sup>12</sup> This phenomenon is of additional importance because financial distress-related delay in hand surgery could represent a source of preventable work or functional disability.<sup>8</sup> Thus, studies are needed to examine whether financial distress is associated with delay of care in hand surgery. Although several studies have investigated barriers to care access in orthopaedic surgery, these have largely relied on surrogate measures of financial status such as insurance type and surrogate outcomes such as the ability to successfully obtain an office appointment.<sup>13-24</sup>

Given that delays in the treatment of common upper extremity conditions can result in worse prognoses in some cases (eg, carpal tunnel syndrome),<sup>25-27</sup> identification of socioeconomic factors that contribute to patients' decisions to delay care is of paramount importance in preventing work or functional disability and ensuring health care access. In this study, we test the null hypothesis that financial distress is not associated with self-reported delay in patients seeking care in the hand clinic. Secondary analysis included an evaluation of the sensitivity of financial distress to differences in socioeconomic variables.

## Materials and Methods

### *Instruments and Variables*

We assessed financial distress using the validated 11-item Comprehensive Score for financial Toxicity (COST) instrument, which has been correlated with income, psychosocial distress, and health-related quality of life.<sup>28,29</sup> As the COST measure was originally developed for patients with cancer, we adjusted items that mentioned cancer to apply more generally, following previous practices for applying the COST measure to non-cancer populations.<sup>11</sup> Total COST scores range from 0 to 44, with higher COST scores indicating better financial well-being. Median COST score is used to divide patients into high and low relative financial distress categories.<sup>7,11,29</sup> We assessed pain catastrophizing, or patients' perception of their own pain, using the 13-item Pain Catastrophizing Scale (PCS).<sup>30</sup> The PCS scores range from 0 to 52, with higher scores corresponding to greater pain catastrophizing. We assessed current pain as well as average, least, and worst pain in the past week with a 10-point numeric pain scale (0 = no pain, 10 = worst possible pain). In addition, we collected demographic information such as age, sex, race/ethnicity, annual household income, employment status, education level, relationship status, and insurance type. All surveys are available in Supplemental Material.

To assess delays in care, we asked the following 4 questions: (1) *Thinking about the reason you are in the clinic for this time, do you feel that you delayed seeing a doctor or other medical person longer than you should have?* (2) "If yes, what was the principal reason?" (3) "In the last 12 months, have you put off, postponed, or skipped seeing a doctor due to cost when you were sick or injured?" and (4) "In the last 12 months, have you skipped a recommended medical test or treatment due to cost?" Question (2) allows for open-ended answers by the patient, but the following responses were precoded: "could not get an appointment," "cost too much," "did not have time," and "thought problem would go away or was not serious enough." The primary outcome variable is italicized. These questions are similar to those used in national surveys to assess patient behavior and those in prior studies to measure delays in access to health care.<sup>31-33</sup> Although no validated survey instrument for measuring objective delays in seeking care currently exists, self-reported delay and actual delay have been shown to be highly correlated.<sup>34</sup>

### *Data Collection*

After obtaining institutional review board approval, we enrolled patients meeting the following inclusion criteria into the study: new patients visiting the hand and upper extremity clinic, at least 18 years of age, and English fluency and literacy. We excluded patients who were presenting for a condition with a traumatic mechanism of injury (eg, fractures). All other nontraumatic conditions were included. We obtained consent and asked eligible patients to complete our survey prior to their consult with the physician. Patients were informed that their responses were anonymous and were given privacy to complete the survey. We manually recorded their diagnosis for the present visit. Completed surveys were electronically transcribed and compiled in REDCap (Research Electronic Data Capture), a Health Insurance Portability and Accountability Act-compliant, web-based application used to collect data for research purposes.<sup>35</sup> All data were collected during a single patient visit, and there was no follow-up.

### *Statistical Analysis*

We performed an a priori sample size estimation using previous COST data showing that 29% of patients who experienced high financial distress delayed myeloma treatment compared with 6% of patients who experienced low financial distress.<sup>7</sup> A total of 84 patients were needed to provide 80% power to detect a difference of at least this magnitude in delaying care between patients of high and low financial distress ( $\alpha = .05$ ). Statistical significance was defined as  $P < .05$ .

**Table 1.** Primary Diagnoses of Entire Cohort.

Primary diagnosis	No. (%)
Osteoarthritis	16 (18.4)
Ganglion cyst	13 (14.9)
Trigger finger	12 (13.8)
Carpal tunnel syndrome	11 (12.6)
Dupuytren contracture	6 (6.9)
Triangular fibrocartilage complex tear	4 (4.6)
Tendonitis	4 (4.6)
De Quervain tenosynovitis	3 (3.5)
Cubital tunnel syndrome	2 (2.3)
Other	16 (18.4)

In cases of missing data, we imputed average pain in the past week by averaging the least and the worst reported pain in the past week. We imputed missing PCS items using a stochastic regression model with age, sex, education, relationship status, insurance type, and observed PCS items as predictors and treated PCS as a continuous variable. This practical approach has been recommended by Eekhout et al.<sup>36</sup> We scored COST items with missing data as previously described.<sup>28</sup> Data on average pain in the past week were missing for 1 (1.1%) of 87 patients. Of the 1131 total PCS items assessed, 10 (0.9%) were missing. No more than 3 PCS items were missing for any individual patient. Of the 957 total COST items assessed, 11 (1.1%) were missing. No more than 2 COST items were missing for any individual patient. Complete case analysis was also performed as a sensitivity analysis.

For categorical variables, we reported counts/percentages and assessed differences using the Pearson  $\chi^2$  test or Fisher exact test, as appropriate. For continuous variables, we reported median or mean/standard deviation and assessed differences using a 2-sample *t* test. We used binomial multivariable logistic regression to correlate delay in seeking care with age, sex, PCS score, and average pain score as predictors. We used stepwise multiple regression with backward elimination and the Akaike information criterion to arrive at a final model that correlates COST score with demographic variables, with the following variables in the initial model: age, sex, race, education, annual household income, employment status, marital status, and insurance type. To be included in the stepwise regression, patients were required to have complete demographic information ( $N = 77$ ).

## Results

A total of 87 patients were included in this study. The primary diagnoses and demographics of the entire cohort are shown in Tables 1 and 2, respectively. Overall, most patients received a primary diagnosis of osteoarthritis, ganglion

cyst, trigger finger, or carpal tunnel syndrome for their current visit. We then subdivided the study population into 2 cohorts by financial distress category using the median COST score (Table 2). Diagnoses did not differ significantly between high and low financial distress cohorts. The 2 cohorts differed significantly with respect to age, race, annual household income, and employment status.

A significantly greater proportion of those in the high financial distress cohort reported having delayed their current visit (57%) compared with those in the low financial distress cohort (30%; Table 3). Those in the high financial distress cohort also showed higher levels of pain catastrophizing and reported greater average pain in the week preceding the visit. Next, we isolated the effect of financial distress on patients delaying their current visit using a multivariable logistic regression model to control for age, sex, pain catastrophizing, and average pain. Adjusted odds ratios from this model are shown in Table 4. Compared with patients experiencing low financial distress, those experiencing high financial distress exhibited a 4.90-fold increase in odds of having delayed their current clinic visit (Table 4). Moreover, pain catastrophizing was an independent predictor of delay in care, with increased pain catastrophizing associated with lower odds of delay. Each 1-point increase in PCS score resulted in a 4% reduction in odds of having delayed the current clinic visit. The effects of age, sex, and average pain on delay of the current clinic visit were not significant in this model. We then conducted a sensitivity analysis by performing a complete case analysis with the same model using only observations for which all PCS and average pain items were complete ( $n = 79$ ). This analysis showed that patients in the high financial distress cohort experienced a 5.14-fold (95% confidence interval: 1.63-16.24) increase in adjusted odds of having delayed their current hand clinic visit. The most-cited reason for delaying the current clinic visit was “thought problem would go away or was not serious enough” (Table 5).

Finally, we measured the sensitivity of the COST score to differences in various socioeconomic factors using stepwise multiple regression with backward elimination. The final model included annual household income, race, education, and marital status as predictors, and its parameters are shown in Table 6 (adjusted  $R^2 = 0.44$ ). The COST score was correlated with household income, with higher income associated with lower financial distress.

## Discussion

In this study, we tested the null hypothesis that financial distress is not associated with self-reported delay of care in a hand surgery clinic. Our results demonstrate that a significantly greater proportion of patients who experience high financial distress delayed their current visit to the hand surgery clinic relative to their counterparts, despite reporting

**Table 2.** Demographics by Financial Toxicity Cohort.

Demographics	Entire cohort (N = 87)	COST score ≤31 (n = 44)	COST score >31 (n = 43)	P value
Age, y				
Mean (SD)	54.2 (15.6)	57.6 (13.9)	50.7 (16.6)	<.05
Range	18-86	21-84	18-86	
Sex, No. (%)				
Male	45 (51.7)	22 (50.0)	23 (53.5)	.91
Female	42 (48.3)	22 (50.0)	20 (46.5)	
Race, No. (%)				
White	55 (63.2)	23 (52.3)	32 (74.4)	<.05
Black	2 (2.3)	1 (2.3)	1 (2.3)	
Asian	18 (20.7)	9 (20.5)	9 (20.9)	
Other	10 (11.5)	9 (20.5)	1 (2.3)	
Education, No. (%)				
High school	16 (18.4)	10 (22.7)	6 (14.0)	.76
2-year college degree	7 (8.1)	4 (9.1)	3 (7.0)	
4-year college degree	29 (33.3)	14 (31.8)	15 (34.9)	
Postgraduate degree	35 (40.2)	16 (36.4)	19 (44.2)	
Annual household income, No. (%)				
<\$50 000	12 (13.8)	11 (25.0)	1 (2.3)	<.05
\$50 000-\$99 999	13 (14.9)	9 (20.5)	4 (9.3)	
\$100 000-\$149 999	8 (9.2)	5 (11.4)	3 (7.0)	
\$150 000-\$199 999	15 (17.2)	4 (9.1)	11 (25.6)	
\$200 000-\$249 999	12 (13.8)	5 (11.4)	7 (16.3)	
>\$250 000	18 (20.7)	3 (6.8)	15 (34.9)	
Employment status, No. (%)				
Full-time employed	53 (60.9)	19 (43.2)	34 (79.1)	<.05
Part-time employed	8 (9.2)	6 (13.6)	2 (4.7)	
Retired	16 (18.4)	12 (27.3)	4 (9.3)	
Other	10 (11.5)	7 (15.9)	3 (7.0)	
Marital status, No. (%)				
Married	48 (55.2)	26 (59.1)	22 (51.2)	.68
Nonmarried	38 (43.7)	18 (40.9)	20 (46.5)	
Insurance type, No. (%)				
Commercial	58 (66.7)	27 (61.4)	31 (72.1)	.17
Medicare	21 (24.1)	11 (25.0)	10 (23.3)	
Medicaid	7 (8.1)	6 (13.6)	1 (2.3)	
Financial toxicity score, No. (%)				
Median	31			
Range	0-44			

Note: Percentages may not sum to 100 because some participants declined to provide answers to some demographic questions. COST = Comprehensive Score for financial Toxicity.

higher levels of pain catastrophizing and pain. This effect became more pronounced after adjusting for age, sex, pain catastrophizing, and pain. We also found that those experiencing high financial distress differed from their counterparts with respect to age, race, annual household income, and employment profiles. These results contribute to a deeper understanding of the patient factors associated with patients' decisions to seek or delay care for their hand condition.

These results contribute to the growing literature on the influence of financial distress on access to health care in the

United States. A recent survey of 11 countries found that US patients were the most likely to experience financial barriers to accessing health care, an effect that was especially salient in older Americans.<sup>3,4</sup> However, the same survey noted that the United States performed better in ensuring access to specialty care, with only a low percentage of adults reporting a delay of 2 months or longer for a specialist appointment.<sup>3</sup> Nevertheless, although specialty appointments in the United States may be available, this may not be sufficient to ensure adequate care access. Our results

**Table 3.** Differences in Delay of Care, Pain Catastrophizing, and Pain Between High and Low Financial Toxicity Cohorts.

Outcome	Entire cohort (N = 87)	COST score ≤31 (n = 44)	COST score >31 (n = 43)	P value
Delayed current visit, No. (%)	38 (43.7)	25 (56.8)	13 (30.2)	<.05
Delayed or skipped any visit in the past year due to cost, No. (%)	15 (17.2)	8 (18.2)	7 (16.3)	1.00
Skipped recommended test or treatment in the past year due to cost, No. (%)	12 (13.8)	8 (18.2)	4 (9.3)	.37
Pain catastrophizing score				
Mean (SD)	12.7 (12.4)	17.7 (13.5)	7.6 (8.6)	<.05
Range	0-49	0-49	0-31	
Numeric pain score				
Mean (SD)	3.4 (2.3)	4.5 (2.2)	2.3 (1.8)	<.05
Range	0-10	0-10	0-7	

Note: COST = COmprehensive Score for financial Toxicity.

**Table 4.** Multivariable Logistic Regression Analysis of Factors Associated With Delay of Care.

Variable	Model parameters	
	Adjusted OR (95% CI)	P value
Age	1.00 (0.97-1.03)	.92
Sex		
Male	Reference	
Female	1.35 (0.52-3.51)	.53
Financial toxicity		
Low	Reference	
High	4.90 (1.58-15.19)	<.05
Pain catastrophizing score	0.96 (0.91-0.99)	<.05
Numeric pain score (average pain)	1.00 (0.79-1.28)	.97

Note: OR = odds ratio; CI = confidence interval.

**Table 5.** Reasons for Delaying Current Clinic Visit.

Reason	No. (%)
Thought problem would go away or was not serious enough	22 (57.9)
Could not get an appointment	3 (7.9)
Cost too much	4 (10.5)
Did not have time	7 (18.4)
Other	8 (21.1)

Note: Percentages do not sum to 100 because some patients gave more than 1 reason for delaying their current clinic visit.

suggest that delays in care for hand conditions are associated with socioeconomic factors such as financial distress, which may influence decision-making. Therefore, future efforts to reduce unnecessary delays in care for hand conditions and improve health might focus on these social factors. Various methods for reducing financial distress have been suggested, including a focus on value-based care, improving health insurance literacy, and physician preparedness to

discuss costs with patients.<sup>37</sup> For example, a recent study found that 84% of patients undergoing elective total joint arthroplasty thought that physicians should discuss the costs of surgical care with patients.<sup>38</sup> Therefore, willingness of hand surgeons to discuss major costs, such as those of elective hand surgery, with patients may help directly reduce financial distress and its deleterious effects, such as delayed care and/or disability.<sup>8</sup>

The most common reason reported by patients for delaying their current visit was “thought problem would go away or was not serious enough” (Table 5). Surprisingly, only 10% of those who delayed their visit to the hand clinic explicitly cited cost as a reason, suggesting that financial distress exerts an effect on delay of care through a different mechanism. That is, our results suggest that financial distress may modify how patients evaluate and conceptualize their health state. Weissman et al<sup>32</sup> have postulated that individual differences may exist in the ability to assess whether a condition is self-limited or requires medical care, which, in light of our results, suggests that financial distress

**Table 6.** Multivariable Linear Regression Analysis of Factors Associated With COST Score.

Variable	Regression coefficient (95% CI)	SE	P value
Household income			
<\$50 000	Reference		
\$50 000-\$99 999	7.05 (0.86 to 13.25)	3.10	<.05
\$100 000-\$149 999	11.97 (4.62 to 19.33)	3.68	<.05
\$150 000-\$199 999	18.09 (11.32 to 24.87)	3.39	<.05
\$200 000-\$249 999	12.05 (4.77 to 19.32)	3.64	<.05
>\$250 000	19.38 (12.89 to 25.86)	3.25	<.05
Race			
White	Reference		
Black	7.88 (-2.74 to 18.50)	5.32	.14
Asian	2.26 (-2.07 to 6.60)	2.17	.30
Other	-5.62 (-11.64 to 0.39)	3.01	.07
Education			
High school	Reference		
2-year college degree	8.32 (1.65 to 14.99)	3.34	<.05
4-year college degree	1.92 (-3.32 to 7.17)	2.63	.47
Postgraduate degree	-2.64 (-7.75 to 2.47)	2.56	.31
Marital status			
Nonmarried	Reference		
Married	-4.79 (-8.39 to -1.19)	1.80	<.05

Note: Adjusted  $R^2 = 0.44$ . COST = CComprehensive Score for financial Toxicity; CI = confidence interval.

may be associated with patients underestimating the severity of their condition. Furthermore, other studies have shown that patients who are more engaged in their own care are less likely to delay care.<sup>39</sup> In the context of our results, this suggests a role for comprehensive care addressing social determinants of health in addition to disease management and effective patient education, especially for patients experiencing high financial distress. As many chronic hand conditions such as carpal tunnel syndrome are progressive in nature, interventions focused on these aspects of health may prevent unnecessary delays in care. In the case of carpal tunnel syndrome, for example, delays in care may translate into progressive nerve damage and inferior clinical outcomes.<sup>26,27</sup>

Finally, the strong positive correlation between COST score and household income (Table 6) supports the role of the COST instrument in evaluating financial distress in this study. A similar financial distress instrument has recently been employed in patients undergoing elective total joint arthroplasties, and similar correlations were found.<sup>38</sup> Taken together, these studies suggest that financial distress is a stable, measurable construct that may influence patient decision-making in hand surgery.

We acknowledge that several limitations to this study exist. First, as we aimed to capture a representative sample of hand clinic patients with nontraumatic conditions, we were unable to segregate by disease stage or chronicity. However, we attempted to mitigate this bias by accounting for factors we believed were more influential in delay of

care decisions, such as pain catastrophizing and pain. Second, as no objective, validated measure of delay of care exists, we measured only patient-reported delay as a binary outcome, which has been shown to be associated with actual delay.<sup>34</sup> We did not query the length of delay in this study, as its relationship to financial distress may be confounded by both patient factors, such as the specific condition or chronicity of disease, and systemic factors, such as the ability to take time off work, compatibility with physician schedule, or appointment availability. Thus, more research on the effect of financial distress–related delay of care on clinical outcomes is needed. Also, our data do not capture patients who avoid care indefinitely or those who could not get an appointment at all, which is more prevalent among low-income populations.<sup>23,24</sup> Thus, our effect size likely underestimates the true effect of financial distress on delay of care. Finally, our study cohort was sampled from a large, suburban academic medical center, which could limit the generalizability of our results. However, the COST instrument allowed us to measure *relative* financial distress by dividing the entire cohort by median COST score. Thus, although our cohort may be more affluent than other populations in which COST scores have been measured,<sup>11,29</sup> experiencing relatively more financial distress still strongly predicted delays in care, suggesting that an even stronger effect may exist when comparing an affluent population with more impoverished populations. In other words, if financial distress is a strong predictor of delay in the less affluent compared with the more affluent, then an even

stronger effect may be observed when comparing groups for which even larger differences in financial distress exist.

In conclusion, financial distress is a strong predictor of patients delaying their visit to the hand surgery clinic. This study reveals the important role of patient factors such as financial distress and pain catastrophizing on delay of care for hand conditions in an insured population. Our findings suggest that patients seeking care for hand conditions who are experiencing high financial distress may benefit from interventions to reduce financial distress (eg, discussion of major surgical costs and access to social/financial services) and/or unnecessary delays in care (eg, effective patient education).

### Ethical Approval

This study was approved by our institutional review board.

### Statement of Human and Animal Rights

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008.

### Statement of Informed Consent

Informed consent was obtained from all individual participants included in the study.

### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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